



# **Lessons To Be Learned**

**from the**

## **July 12, 2007 Paducah Forklift and Pedestrian Accident and How to Prevent a Similar Accident**

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Type B AI Board Chairman  
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# Why Lessons Learned?

“The Department wants to integrate the ISM core functions, ISM principles, HRO principles, HPI principles and methods, **lessons learned**, and internal and external best safety practices into a proactive safety culture ... to help DOE and its contractors ... create a world-class safety culture, and ultimately to result in achievement of performance excellence.

DOE M 450.4-1, ISM System Manual, November 1, 2006  
Chapter I, Overview and Responsibilities – Introduction

# Guiding Principles for ISM

## Identification Of Safety Standards & Requirements

*Before work is performed, the associated hazards shall be evaluated and an agreed-upon set of safety standards and requirements shall be established which, if properly implemented, will provide adequate assurance that the public, the workers, and the environment are protected from adverse consequences.*

## Attributes

- The organization **actively seeks continuous improvement** to safety standards and requirements **through identification and sharing of** effective practices, **lessons learned**, and applicable safety research.

DOE M 450.4-1

# Supplemental Safety Culture Elements

## Organizational Learning for Performance Improvement

*The organization demonstrates excellence in performance monitoring, problem analysis, solution planning, and solution implementation. The organization encourages openness and trust, and cultivates a continuous learning environment.*

### Attributes:

- Organization members convene to swiftly **uncover lessons and learn from mistakes**. Frequent incident reviews are conducted promptly after an incident to ensure data quality to identify improvement opportunities.

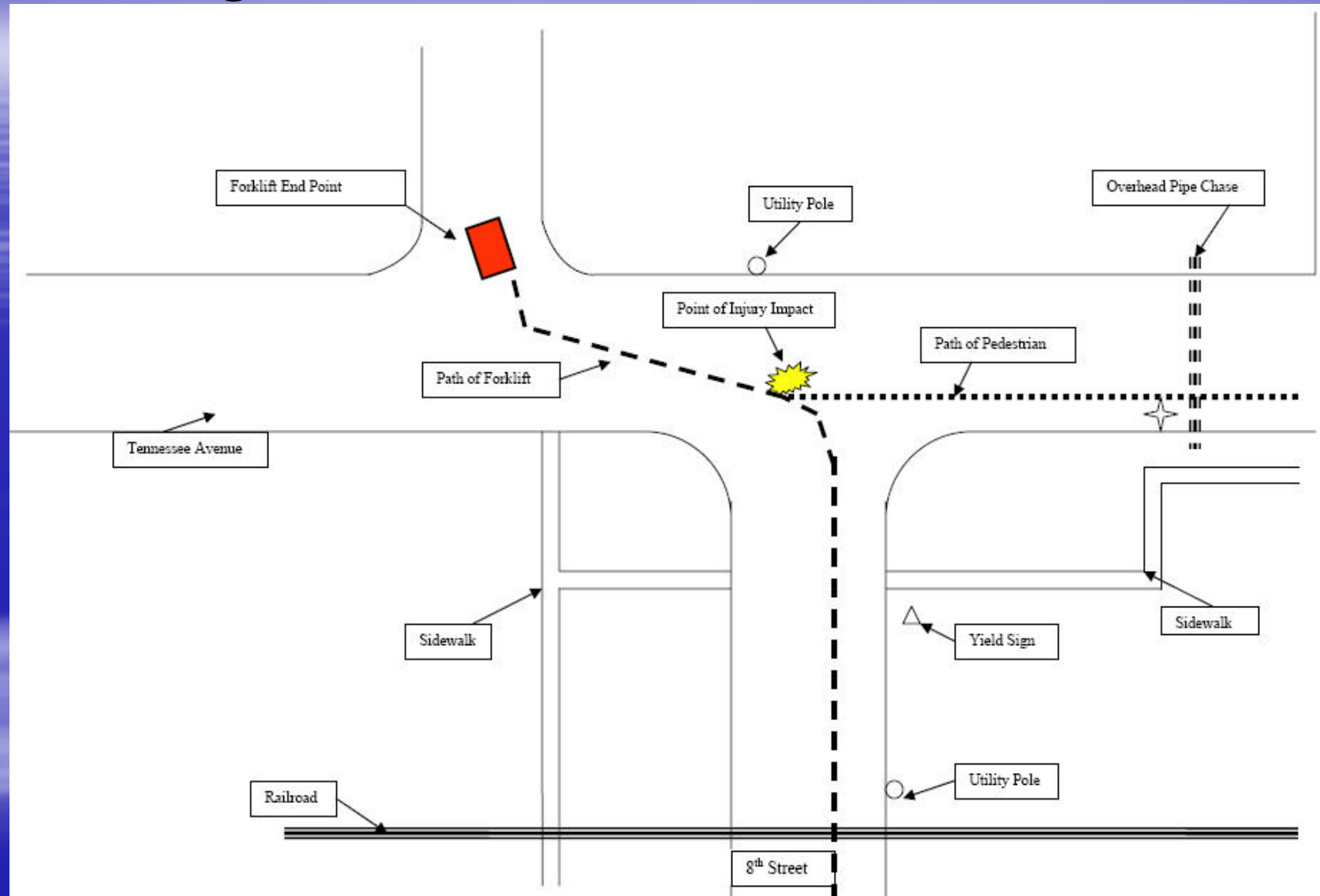
DOE M 450.4-1



# Accident Facts and Conditions

- DOE Contractor Employee [Pedestrian] Walking West on Tennessee Ave. on her Lunch Break, Facing Traffic Flow
- Clear and Sunny Conditions, No Visual Obstructions
- Private Company Employee [Driver] Driving Forklift North On 8<sup>th</sup> St. Transporting Liquid N<sub>2</sub> Dewars
- Collision Occurred Near the Center of the Intersection
- Neither the Pedestrian nor the Driver Indicated Being Aware of the Other Party
- No Witnesses to the Accident are Known

# Diagram of PGDP Accident Scene



July 2007 Forklift Accident and  
How to Prevent A Recurrence

# Post Accident Sequence

- Driver Turned at Next Corner and Noticed the Pedestrian Laying in Intersection
- Driver Stopped and Rendered Assistance
- Driver Surprised to Hear “You Ran Over Me.”

# Photographs

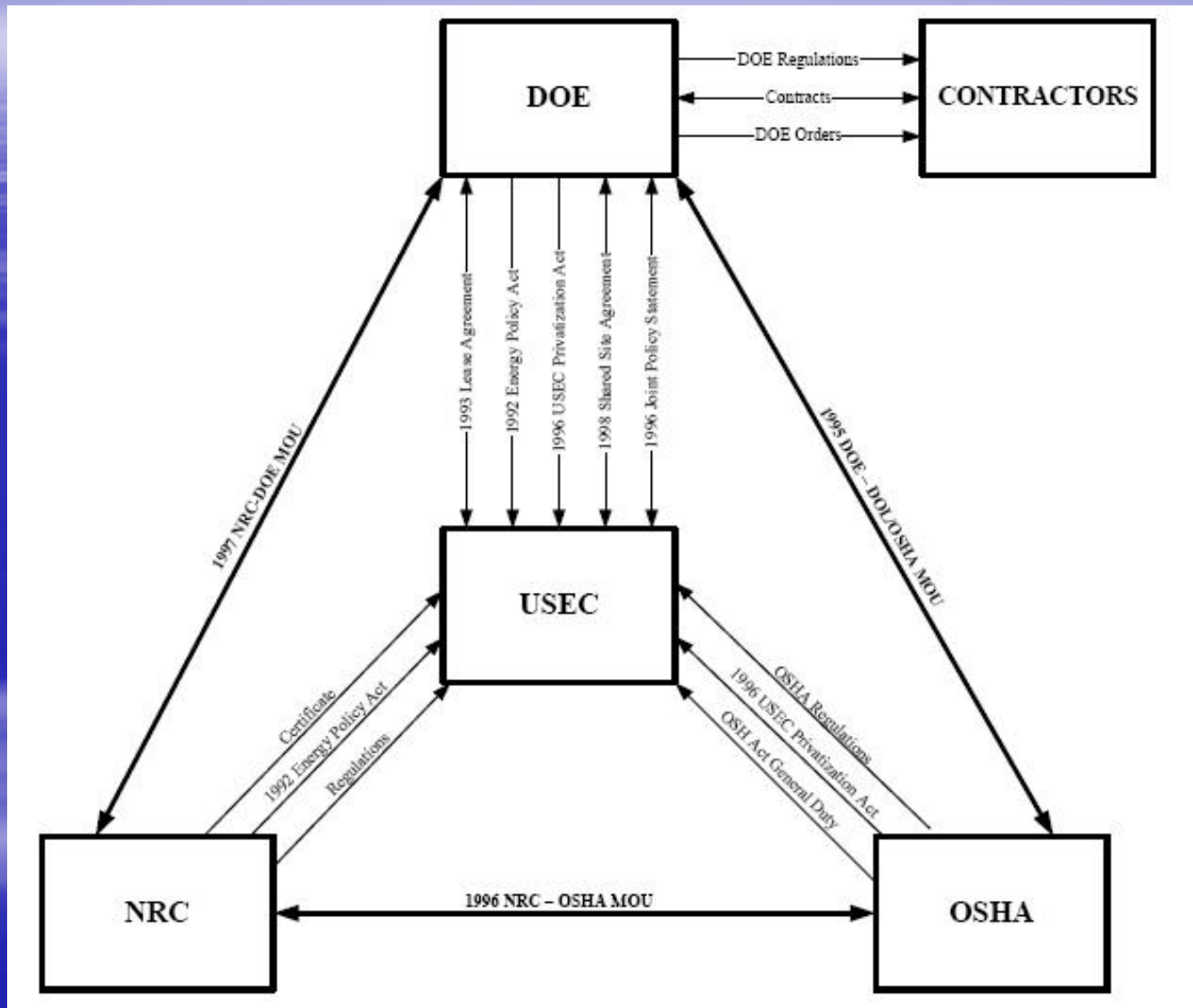




# Background Facts Related to the Accident

- No Unusual Conditions Observed by Co-Workers
- No Convenient Sidewalk Exists Along Tennessee Ave.
- Driver's Forward Visibility Blocked by N<sub>2</sub> Dewars
- Driver's Diagonal Visibility Blocked by Windshield Post
- Driver did not Feel or Hear Anything During the Impact
- Driver Impaired by Various Physical Conditions
- Driver Taking Multiple Prescription Medications

# Federal Oversight Interfaces with USEC



# PGDP Traffic Safety

## **Traffic Control Devices:**

- “Yield” Sign on 8<sup>th</sup> St. 30 ft. South of the Intersection
- Sidewalk on Both Sides of 8<sup>th</sup> St. South of “Yield” Sign
- No Marked Crosswalk at the Intersection or sidewalks

## **Traffic Safety Training Related to Pedestrians:**

- DOE Contractor General Employee Training (May 05):
  - “Drivers Must Yield at All Crossings for Pedestrians.”
  - “Always Allow Pedestrians & Heavy Equipment the Right-of-Way.”
- USEC Visitor Orientation Handbook Training (Jun. 06):
  - “Pedestrians Have the Right-of-Way In Designated Crosswalks.”

# PGDP Employee Concerns Programs

## **No Formal Concerns of Forklift/Traffic Safety at PGDP**

- Several USEC Employees Expressed or Displayed Discomfort During Interviews About Raising Safety Concerns
- Some USEC Employees Admitted to Having Safety Concerns and not Reporting
- Evidence of Lack of Effective Action on Reported Safety Concerns



# USEC Forklift Safety Programs

- Follows OSHA Requirements in 29 CFR Part 1910.178
  - Training, Evaluation, and Certification of Forklift Drivers
- USEC Program Addresses Training and Certification
  - Candidates Must Have Medical Examination for Certification
  - Requires Training and Certification of Mobile Equipment Operators
  - Classroom Instruction and Written Examination
  - Successful Completion of a Practical Demonstration
  - Refresher Training Required Consistent With OSHA Requirements
  - Requalification Required After Three Years
- Discontinued Requiring CDL for FL Operators in 2002

# DOE Forklift Fatality in 1991

## Similar in Many Ways to the 2007 Event:

- Large FL Traveling Backwards due to Large Load
- Forklift Design Limited Driver's Visibility
- Selection of Forklift for Load Movement Inappropriate
- No Sidewalks Available for Use
- Pedestrian Walking in the Road
- Driver Unaware of Pedestrian
- No Risk / Hazard Analysis for Forklift Operations
- Traffic Safety Policies not Clearly Defined
- Employee Safety Concerns Requested Sidewalks

# Forklift Operations Suspension – July 2006

## **Adverse Trend Identified from Forklift Events**

- Contractor Initiated a Full Evaluation of Forklift Program:
  - Implementing Procedures, Retraining, & Evaluation of Drivers
- Forklift operations were resumed on a phased approach
  - Forklift Drivers Received Refresher Training
  - Issued Guidance to Define Roles & Responsibilities for Spotters
  - Using Flatbed Trucks Instead of Forklifts for Moving Large Items
  - Evaluating Using Traffic Plans for Transport Work Documents
- No Lessons Learned Report was Issued
- No Information From This Event Communicated to USEC

# Judgments of Need - 1

A single, clearly defined site-wide policy for vehicle/traffic safety management, communicated to and understood by all employees and visitors.

Also evaluate the adequacy & effectiveness of existing traffic control measures/devices.



# Judgments of Need - 2

DOE-HQ process to

- verify the completion of approved corrective actions and satisfaction of judgments of need, and
- to ensure that records pertaining to these responsibilities are available for future use.

# Judgments of Need - 3

Clearly defined expectations for performance of oversight of industrial safety...  
representing all organizations involved with work at the Site.

# Judgments of Need - 4

Fully implement existing procedures for performing fitness for duty evaluations to ensure the safety of employees and co-located workers.

# Judgments of Need - 5

## Evaluate

- the suitability of existing industrial equipment,
- policies for industrial equipment selection, and
- processes for hazard identification and mitigation.



# Judgments of Need - 6

Formalize and implement an effective, integrated process for identifying and resolving shared site issues, including ... industrial safety hazards.

# Actions to Prevent a Recurrence

- Evaluate Existing Traffic Safety Policies
  - Consistency and Common Sense
  - Employee Understanding
  - Employee Sensitivity to Vehicle Traffic
- Evaluate Existing Traffic Controls
  - Appropriate Sidewalks, Convenient to Use
  - Painted Sidewalks Where Necessary
  - Consider Use of High Visibility Vests

# Actions to Prevent a Recurrence

- Evaluate Expectations for Performing Oversight of Industrial Safety
  - Focus on:
    - Areas of Corporate Interface
    - Areas of Regulatory Interface
    - Areas of Project / Organizational Interface
  - Timely and Appropriate Periodicity
  - Communication of Issues and Deficiencies

# Actions to Prevent a Recurrence

- Evaluate Employee Concerns Process
  - Workers Comfortable Raising Safety Issues
    - Concerns Not Reported due to Real or Perceived Fear of Repercussions?
- Evaluate Fitness for Duty Program
  - Existing Procedures / Processes
  - Line Management Involvement
    - Consider Production Pressure to Continue Work
  - Understand / Recognize Warning Signs / Indicators
  - Analyze and Communicate Performance Trends



# Actions to Prevent a Recurrence

- Evaluate Safety Issue Resolution Process
  - Formal Documented Process
  - Defined Responsibilities and Authorities
  - Line Management Accountability
  - Issue and Corrective Action Tracking
  - Dispute Resolution Process
  - Site-wide Communication Process for Sharing Lessons Learned Information

# Actions to Prevent a Recurrence

- Evaluate Accident JONs for Applicability
  - Study Both Forklift Accidents
  - Similar Weaknesses Possible at Your Site?
  - Compensatory Measures and Corrective Actions
- Review Type A and B Accidents
  - How Familiar With Other Prior Accidents?
  - Causal Factors Understood and Eliminated?
  - Re-Evaluate Corrective Action Effectiveness

# Actions to Prevent a Recurrence

- ISM – Hazard Identification and Mitigation
  - Evaluate Suitability of Industrial Equipment
  - Evaluate Processes for Equipment Selection
  - Evaluate Existing Processes for Identifying and Mitigating Industrial Safety Hazards
    - Ongoing Job Hazard Analysis Review & Update
  - Evaluate Application of Lessons Learned to Work Planning

# Conclusion

- This Accident was Near-Miss to a Fatality
- This Accident was Preventable
- Multiple Missed Opportunities Existed to Identify and Correct Causal Factors
- ISMS Can Prevent a Similar Accident by:
  - Aggressive Hazard Identification & Mitigation
  - Rigorous Fitness for Duty Determination
  - Effective Lessons Learned Application